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# Electric and Hybrid Vehicles

## Design Fundamentals

**"Dr. Husain's book, *Electric and Hybrid Vehicles: Design Fundamentals*, is a thorough and insightful introduction to the interdisciplinary topic of traction design for road vehicles. The necessary requirements of energy storage, conversion and processing are presented as the means to providing vehicular performance in a logical progression that students will find readily understandable and practicing engineers will appreciate as a useful reference source. Overall the practical importance of systems engineering and its control are made evident. Salient features are emphasized by worked examples with realistic parameters."**

—Alan Wallace,
Department of Electrical Engineering, Oregon State University

**"...a balanced blend of traditional and relatively new topics ...The basic aspects of electric and hybrid vehicles are discussed well — from overall concepts to more detailed design — and reinforced through good examples, illustrations, and exercise problems."**

—Longya Xu, Professor,
Department of Electrical Engineering, The Ohio State University

## A technical, systems-level approach to next-generation vehicles

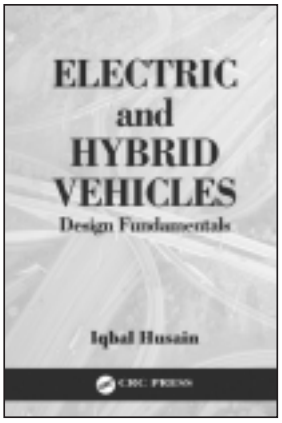
With advances driven by pressure from governments, environmental activists, and its associated industries, the subject of electric and hybrid vehicles is becoming increasingly important. Trends clearly suggest that engineers must be conversant in the technical details of these vehicles. While there are many books that provide narrative descriptions of electric and hybrid vehicle components, none cover the technical aspects from a mathematically derived, design point of view.

**Electric and Hybrid Vehicles: Design Fundamentals** presents a comprehensive, systems-level perspective of these vehicles that strikes an outstanding balance between technical details, design equations, numerical examples, and case studies. Starting with some historic background, the author describes the system components, the laws of physics governing vehicle motion, the mathematical relationships within and between the components, energy sources, and designing components to meet the complete vehicle specifications.

As this book illustrates, the electric vehicle is an excellent example of electro-mechanical and electro-chemical systems, one that is intriguing, yet technically challenging. The material is ideal for reference, self-study, and short-course work, and the equations presented can be used to develop system-level modeling and simulation tools on suitable platforms, such as MATLAB® and Simulink.


## Iqbal Husain

*University of Akron, Ohio, USA*


## Features

- Presents a practical, mathematically derived study of design guidelines and the technical aspects of electric and hybrid vehicles
- Includes design examples that help bridge theory and practice
- Contains numerous example problems, exercises, and illustrations in each chapter
- Demonstrates mathematical relationships between system components using design equations

*See reverse for contents...*

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